

Claims:

1. A method for inert gas welding or inert gas soldering of workpieces (A) made of steel, aluminum, magnesium, copper or alloys thereof with workpieces (B) made of steel, aluminum, magnesium, copper or alloys thereof, using an additional molten metal alloy, wherein said workpieces (A) and (B) may consist of identical or different metals or metal alloys, characterized by the following steps:
 - a) abutting or overlapping contacting of the workpieces to be joined;
 - b) melting the additional metal alloy containing a Zn base alloy;
 - c) applying the molten additional metal alloy on the contact surfaces or partial areas of the contact surfaces of the contacted workpieces;
 - d) cooling the joined workpieces;steps b) and c) being carried out one immediately after the other, with at least steps b) and c) being carried out using an inert gas.
2. The method according to claim 1, characterized in that the workpieces of steel consist of galvanized or non-galvanized steel.
3. The method according to one or more of claims 1 or 2, characterized in that said melting of the additional metal alloy is effected in an electric arc or by means of a plasma process or by means of laser.

4. The method according to one or more of claims 1 to 3, characterized in that the workpieces are joined with or without the use of a fluxing agent.
5. The method according to one or more of claims 1 to 5, characterized in that the Zn base alloy includes from 1 to 25 wt.-% Al.
6. The method according to claim 5, characterized in that the Zn/Al alloy may include one or more of the following alloying additives as single components or in combination: up to 500 ppm Mg, up to 500 ppm Cr, up to 2000 ppm Mn, up to 300 ppm Li, up to 4% Cu, up to 50 ppm B, up to 500 ppm Ti, and up to 1000 ppm Si.
7. The method according to one or more of claims 1 to 6, characterized in that the workpieces are joined using additional metal alloys, the melting temperatures of which ranging from 370 to 600°C.
8. The method according to one or more of claims 1 to 7, characterized in that the additional metal alloy is employed in the form of a solid wire or cored wire.
9. Use of a wire having a diameter of from 0.8 to 3.2 mm, said wire consisting of a zinc base alloy including an Al content of from 1 to 25 wt.-%, in a method for inert gas welding or inert gas soldering of workpieces A made of steel, aluminum, magnesium, copper or alloys thereof with workpieces B made of steel, aluminum, magnesium, copper or alloys thereof, wherein said workpieces A and B may consist of identical or different metals or metal alloys.
10. The use according to claim 9, characterized in that the Zn/Al alloy may include one or more of the following alloying additives as single components

or in combination: up to 500 ppm Mg, up to 500 ppm Cr, up to 2000 ppm Mn, up to 300 ppm Li, up to 4% Cu, up to 50 ppm B, up to 500 ppm Ti, and up to 1000 ppm Si.

11. The use according to claim 9 or 10, characterized in that the wire is a solid wire or a cored wire.